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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/726,248	12/02/2003	James E. Walson	59376US002	3537

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3M INNOVATIVE PROPERTIES COMPANY
PO BOX 33427
ST. PAUL, MN 55133-3427

EXAMINER

GUHARAY, KARABI

ART UNIT PAPER NUMBER

2879

DATE MAILED: 11/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/726,248

Applicant(s)

WALSON ET AL.

Examiner

Karabi Guharay

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Amendment, filed 21 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>8/16/2006 & 3/13/06</u> | 6) <input type="checkbox"/> Other: _____ |

Response to Amendment

Amendments of specification and Abstract are approved.

Amendment is objected for the error in claims 5, 7 & 8, which contain a typographical error of "claim 0". Appropriate corrections are required.

Claims 5, 7 & 8 are considered to be dependent on claims as presented in original set of claims. Amendment of claim 38 overcomes the rejection of claim 38 under 35 USC 112 second paragraph.

Applicant's are advised to update information of related applications in page 1 of specification.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 12-17, 25-27, 31-32 are rejected under 35 U.S.C. 102(e) as being anticipated by Durocher et al. (US 6733711).

Regarding claims 12-13 and 26-27, Durocher discloses e a light source (Fig 11) comprising two or more LED dies (a plurality of LED dies 59) arranged in array capable of emitting LED light, two or more optical couplers (plurality of lens 67 & 31) for coupling light from respective LED dies (lines 57-59 of column 8), an intermediate layer (65)

disposed between the LED dies and the coupler (67), the intermediate layer being transparent to the LED light (lines 35-36 of column 8) and a phosphor layer disposed on the intermediate layer between intermediate layer and the coupler (phosphor layer is formed on the inner surface of 67, see lines 63-64 of column 8).

Regarding claim 14, Durocher discloses that the LED dies are encapsulated (lines 30-32 of column 8).

Regarding claim 15 & 31, Durocher discloses that the LED dies are disposed on a substrate (41 of Fig 5).

Regarding claims 16 & 32, Durocher discloses at least one stand off disposed between intermediate layer and the substrate (see Fig 5).

Regarding claim 17, Durocher discloses the coupler (31) formed with aperture having reflective sidewalls (36, 39 of Fig 3).

Regarding claim 25, Durocher discloses that the electric power is applied to the LED (which inherently provides a power supply, see lines 50-52 of column 1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-9, 11, 18-23, 28-30, are rejected under 35 U.S.C. 103(a) as being unpatentable over Durocher et al. (US 6733711), and further in view of Miller et al. (US 6155699).

Regarding claims 1-2, Durocher et al. disclose a light source (Fig 11) comprising LED dies (a plurality of LED dies 59) arranged in array capable of emitting LED light; optical couplers (plurality of lens 67) for coupling light from respective LED dies (lines 57-59 of column 8), phosphor patches (LED dies 59 contains a phosphor layer on top of it, see lines 61-62 of column 8) disposed between the LED dies and the optical coupler (67) to convert at least a portion of the LED light propagating to the optical coupler (lines 41-48 of column 8).

But Durocher fails to disclose an intermediate layer disposed between LED dies and the phosphor patches, the intermediate layer transmitting LED light and reflecting light converted in the phosphor, intermediate layer having a first side facing the LED and a second side facing the coupler, and phosphor is disposed on the second side of the intermediate layer.

However, In the same field of LED, Miller discloses an LED device (see Fig 2 & 6) having an intermediate layer (DBR mirror 30, 46) disposed between LED die (12, 42) and the phosphor patches (36, 48) transmitting LED light and reflecting light converted in the phosphor, intermediate layer (30, 42) having a first side facing the LED and a second side facing the coupler (22 or 50, see Fig 2), and phosphor is disposed on the second side of the intermediate layer (lines 10 of column 5 -line 45 of column 6).

Further Miller teaches that having a wavelength selective reflector (in this case DBR mirror 30, 46) enhances the light output by allowing high percentage of primary light to reach phosphor and reflecting much of the converted secondary light that is emitted towards the LED (lines 65 of column 2-line 9 of column 3).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate a wavelength selective reflector disposed between LED and phosphor as disclosed by Miller in the device of Durocher in order to improve light output from the device.

Regarding claim 3, Durocher discloses that the LED dies are encapsulated (lines 30-32 of column 8).

Regarding claim 4, Durocher discloses that the LED dies are disposed on a substrate (41 of Fig 5).

Regarding claim 5, the combined structure of Durocher & Miller discloses at least one stand off disposed between intermediate layer and the substrate (see Fig 5 of "711).

Regarding claim 6, Durocher discloses the coupler (31) formed with aperture having reflective sidewalls (36, 39 of Fig 3).

Regarding claim 7, Durocher discloses that the phosphor patches register with respective apertures (35).

Regarding claim 8, the combined structure of Durocher & Miller discloses that the phosphor patches extend into the apertures from the intermediate layer (since the phosphor layer is positioned above the intermediate layer with in the aperture (35).

Regarding claim 9, 22 & 30, Miller discloses a reflecting layer (side wall of 14) disposed to reflect LED light that has passed through the phosphor layer back to the phosphor layer back to the phosphor layer (since reflecting layer 14 extends above the phosphor patch 52). The same reason for combining art as in claim 1 applies.

Regarding claim 11, Durocher discloses that the electric power is applied to the LED (which inherently provides a power supply, see lines 50-52 of column 1).

Regarding claims 18 & 28, Miller et al. disclose that the phosphor layer (36) is provided on the intermediate layer (30) and positioned corresponding to areas of the intermediate layer illuminated by LED die (see Fig 2).

Regarding claims 19-20, Miller et al. disclose that the coupler (14) is formed in aperture through the coupler sheet and the phosphors are registered with the apertures (Fig 2), and phosphor patch (36) register with the aperture and extends into the aperture from the intermediate layer (Fig 2).

Regarding claims 21 & 23, Miller et al. disclose that the intermediate layer (30) reflects converted wavelength (lines 40-45 of column 6).

Regarding claim 29, Miller et al. disclose that the first layer (30) reflects light converted by the phosphor to a longer wavelength than the wavelength of the LED light (lines 17-33 of column 7).

Claim 24 rejected under 35 U.S.C. 103(a) as being unpatentable over Durocher et al. as applied to claim 12 above, and further in view of Ota et al. (US 6943380).

Regarding claim 24, Durocher teaches all the limitations of claim 24 except for a set of optical fibers disposed to receive light from the coupler.

However, Ota et al. discloses LED light source and further teaches the use of optical fibers for extracting and optical transmission of light emitted from LED (lines 28-35 of column 11).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use set of optical fibers in order to transmit light from the LED array.

Claim 10 rejected under 35 U.S.C. 103(a) as being unpatentable over Miller & Durocher et al. as applied to claim 1 above, and further in view of Ota et al. (US 6943380).

Regarding claim 10, combined structure of Miller & Duracher et al. teach all the limitations of claim 10 except for a set of optical fibers disposed to receive light from the coupler.

However, Ota et al. discloses LED light source and further teaches the use of optical fibers for extracting and optical transmission of light emitted from LED (lines 28-35 of column 11).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use set of optical fibers in order to transmit light from the LED array.

Claims 33-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al. (US 6949772), and further in view of Miller et al. (US 6155699).

Regarding claims 33-39, Shimizu et al. disclose a method of assembling a light source comprising providing a plurality of LED dies arranged in a regular array patterns on a LED subassembly and attaching the LED subassembly (see Fig 1a & 1b) to a first layer (23) comprising holes (32a) providing reflecting layer and with transparent mold (24) which is substantially transparent to the LED light (lines 7-16 of column 2),

Art Unit: 2879

positioning the first layer over the LED dies so that light passes through the first layer (23), where first layer comprises a plurality of stand-offs (24) and attaching the first layer comprises attaching the stand-offs to the LED subassembly (lines 43-57 of column 1).

However, Shimizu et al. fails to disclose a layer of phosphor as patches on a surface of the first layer corresponding to areas where light passes from the LED dies, and the first layer transmits LED light but reflects light that is wavelength converted in the phosphor.

Miller et al. in the same field of LED lighting disclose a light source (see Fig 2) comprising LED die (12), a first layer (28, 30) disposed over the LED die, the first layer (28, 30) layer being substantially transparent to the LED light (lines 9-18 of column 6), the LED light propagating through the first layer from a first side to a second side and a phosphor layer disposed as patch (36) on the second side (lines 62-67 of column 5), the first layer transmits LED light but reflects light that is wavelength converted in the phosphor (lines 10-45 of column 6). Miller further teaches that such DBR mirror (30) and the disposition of phosphor (36) on the DBR mirror improves the flux of light emitted from the light source (lines 58 of column 20-line 9 of column 3).

Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate a first layer (30) and a phosphor layer (36) as disclosed by Miller et al. in the device of Shimizu et al, since this will provide improved light emission.

Response to Arguments

Applicant's arguments, filed on 21 July 2006 with respect to claims 1-32 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments filed 21 July 2006, regarding claims 33-39 have been fully considered but they are not persuasive.

Applicant contends that Shimizu does not describe positioning the plate 23 over the LED dies.

Examiner, however, respectfully disagrees, Shimizu does position the intermediate plate 23 over the LED dies so that each hole or aperture corresponds to each LED die.

Further Miller teaches providing Phosphor.

Further applicant contends that Miller does not teach positioning. Examiner agrees.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karabi Guharay whose telephone number is 571-272-2452. The examiner can normally be reached on Monday-Friday 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2879

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

K. Guharay
Karabi Guharay
Primary Examiner
Art Unit 2879

11/9/06